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ABSTRACT

Teacher's knowledge of the relationship of auditory acuity and hearing impairment to reading was evaluated with 60 teachers and specialists (regular classroom primary and upper elementary teachers, reading teachers, teachers of the learning disabled, teachers of the hearing impaired, and speech and language pathologists). Ss were administered a 52-item multiple choice test measuring understanding of and attitude toward hard of hearing children. Results showed that specialists were better informed than teachers on overall knowledge. Teachers of the hearing impaired and speech and language pathologists did better on the total test items than other subgroups, but teachers of the hearing impaired lead all other subgroups. Other results included that teachers of the hearing impaired were far more knowledgeable about the relationship between hearing impairment and reading than primary teachers and speech and language pathologists. Teachers and specialists showed similar attitudes about judging the educational achievement of the hearing impaired in the regular classroom. Findings suggested the need for greater assistance by communication consultants in elementary schools. (CL)

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TEACHERS' KNOWLEDGE OF THE RELATIONSHIP OF AUDITORY ACUITY AND HEARING IMPAIRMENT TO READING

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Introduction

Proficiency in reading and speech is contingent upon adequate auditory acuity. Auditory acuity is the ability of the child to hear and perceive auditory signals of very low intensity. Auditory acuity is the primary vehicle for auditory perception, is the first step in listening comprehension, and is required for discriminating differences between sounds. Inadequate auditory acuity or hearing loss may impede successful development of listening, speech, and reading.

Research articles have reported the importance of auditory discrimination, reading, and other areas of achievement, to listening, and to other cognitive variables. Despite the obvious importance of hearing to academic work, there is minimal information available regarding teachers' knowledge about auditory acuity and hearing impairment and the relationship of auditory acuity and hearing impairment to reading.

Most of the research has been concerned with determining teachers' knowledge of (1) reading pedagogy, (2) hearing impairment, (3) the need for competencies, (4) attitudes toward handicapped children, (5) assessment of competencies for teaching the hearing impaired in integrated situations, and (6) the integration of the hearing impaired in regular classes.

Most of the studies on auditory disability have pertained to special schools and special rooms for the deaf. To complicate analysis of the research, most researchers tend to vary in their use and definitions of terminologies on hearing impairment (Quigley, 1960; Wiley, 1971). However, research on hard-of-hearing pubils in the regular classrooms pertained to academic growth or skills development and to establishing a relationship between hearing and reading. Historically, research has centered on the learner variable (i.e., pupils' reading achievements) and the environmental variable (i.e., methods and materials) but not enough studies have centered on teacher knowledge. This study will focus on the teacher knowledge variable (i.e., teachers' knowledge of the relationship of auditory acuity and hearing impairment to reading.

Definitions

For the purpose of this study, the term, hearing impaired, is preferred because it is not perceived negatively and does not cause a person to assume personal, academic, or social level as a result of an audiometric assessment (Northcott, 1973). Hearing impairment is a generic term of which the deaf and hard-of-hearing are the subcategories. A hard-of-hearing child is one whose hearing, to an extent, may be difficult but the loss does not prevent the understanding of conversational speech through

the ear alone, with or without a hearing aid (Kirk and Gallagher, 1979). A child who is deaf is born with little or no hearing or has suffered the loss early in infancy before speech and language are acquired (Kirk and Gallagher, 1979).

Method

Six groups of teachers and specials were used in the study, totalling sixty adults. These six groups of teachers and specialists consisted of regular classroom primary teachers (PT), regular classroom upper elementary teachers (UT), reading teachers (RT), teachers of the learning disabled (LDT), teachers of the hearing impaired (HIT), and speech and language pathologists (SLP). The question was whether teachers and specialists would demonstrate similar basic knowledge and attitudes toward the hearing impaired and reading. Stated alternatively, the following general questions were posed:

1. Are there differences in basic knowledge about auditory acuity and hearing impairment, the relationship between hearing impairment and reading, and attitude by sub-group?

2. How much basic knowledge about auditory acuity and hearing impairment do these teachers and specialists have?

3. How much basic knowledge about the relationship between hearing impairment and reading do these teachers and specialists have?

4. What are the attitudes of these teachers and specialists toward the hearing impaired?

A fifty-two multiple-choice test, An Assessment of Teacher Knowledge of Hearing Impairment and Reading, designed by the author, assessed teachers' and specialists' knowledge about auditory acuity and hearing impairment, attitudes about hearing-impaired children; and the relationship between hearing and reading for hearing-impaired children (i.e., adaption of reading techniques); and some demographic information: the following areas were studied:

1. understanding of the area of auditory acuity,
2. understanding the auditory screening and measurement procedures which would include the subcategories of
    a. the audiometer,
    b. the audiogram,
    c. frequency and intensity,
    d. the interpretation of the audiogram,
3. understanding of hard-of-hearing children and their characteristics,
4. understanding of the effective adaption of techniques for hard-of-hearing children's reading needs, and
5. appraising teachers' attitudes toward hard-of-hearing children.

Results of the Demographic Data

This part of the study observed teachers and specialists in regard to their responses to certain demographic questions. The summary of the results of the demographic data were derived from the six subgroups.

For the total group, there were forty-nine females (82%) and eleven males (18%) who participated in the study. The small number of male participants is not surprising. There are usually more female teachers at the elementary level than there are male teachers. The median age range by subgroups was 25 to 40 years of age. The primary teachers had the highest median age range of 35 to 40 years of age. The age range tended to indicate a close proximity in ages and relatively young groups of teachers and specialists.

The mean years of teaching experiences by subgroups ranged from 8.5 to 15.5. The teachers of the hearing impaired and the speech and language pathologists had a mean of 15.5 and 14.0, respectively. Thirty teachers and specialists had master's degrees, eleven had master's plus thirty hours, and one specialist had an Education Sepcialist's degree.

For the mean hours in undergraduate reading courses, by subgroups, teachers and specialists ranged from 6.0 to 10.6. The range for the mean hours in graduate reading courses by subgroups was from 7.2 to 16.6.

The teachers of the learning disabled had the highest mean for undergraduate hours, while the reading teachers had the highest for graduate hours in reading courses

Results of the Research

To recapitulate, the purpose of this study was to determine whether teachers and specialists demonstrated similar knowledge about auditory acuity and hearing impairment, the relationship between hearing impairment and reading and attitudes toward the hearing impaired. The results showed that specialists were better informed than teachers on overall knowledge. When the six subgroups were compared by subgroups, teachers of the hearing impaired and speech and language pathologists did better on the total test items, but the teachers of the hearing impaired lead all subgroups.

On knowledge about auditory acuity and hearing impairment, per se, teachers of the hearing impaired and speech and language pathologists had a greater understanding of the basic concepts than primary and upper elementary teachers, reading teachers, and teachers of the learning disabled, while teachers of the hearing impaired lead all subgroups.

On the relationship between hearing impairment and reading, teachers of the hearing impaired showed similar knowledge as upper elementary teachers, teachers

of the learning disabled, and reading teachers. Teachers of the hearing impaired, however, were far more knowledgeable than primary teachers and speech and language pathologists.

On attitudes, teachers and specialists showed similar attitudes about judging the educational achievement of the hearing impaired in the regular classroom. However, one item is insufficient for a true appraisal. More research is recommended regarding attitudes among teachers and specialists toward the hearing impaired.

For future inservice training and staff development, teachers and specialists tended to need assistance in the areas of adaptation of techniques for the hearing impaired, in the understanding of their learning styles, and in the development of language (speech area). Specific areas of skill development preferred by teachers and specialists were reading comprehension and language (speech area).

Discussion

Federal and state (Michigan) legislation has affected the educational programming of handicapped children, particularly, the hearing impaired. Because of these mandates, more hearing-impaired children are in the regular classrooms. Therefore, more information and directions for teachers and some specialists are needed to assist in classroom management and instructional techniques for the hearing

impaired. The leadership role of teachers of the hearing impaired and speech and language pathologists, as consultants, should definitely be increased in the elementary schools where academic foundations are laid and are established. Present twice-a-week visitations, in some schools by consultants to provide services to pupils and teachers is definitely insufficient. Teachers have definitely demonstrated that they lack skills and concepts to adequately or minimally train the auditorially-impaired in their classrooms.

More visitations by communication consultants in the elementary school buildings are needed, because hard-of-hearing children in the regular classrooms progress more slowly than normal-hearing children and tend to be one-half to two years retarded academically (Sprunt and Finger, 1949; Kodman, 1961; Embrey, 1971). Also, hard-of-hearing children in the regular classrooms have difficulties or tend to be retarded in language functioning, auditory discrimination tasks, verbal attainment, and concepts (Young and McConnell, 1957; Geotzinger, 1962; Owrid, 1970; Embrey, 1971; Davis, 1974). These skills are essential in all the academic areas. It is unlikely that the four groups of teachers (PT, UT, RT, LDT) are aware of these kinds of problems when planning teaching techniques and developmental skills for hard-of-hearing children. Trained consultants, available in

the buildings on a daily basis would assure teachers and other specialists that a consultant is immediately available and is more familiar with the needs of the auditorially impaired. Guidance and help can be readily sought.

In the review of the literature, positive feelings were indicated by teachers toward willingness to work with consultants and specialists, concerning hearing and visually handicapped individuals (Logan, 1977). This should be encouraging to parents of the auditorially and visually impaired and to administrators.

Since these teachers (PT, UT, RT, LDT) have little background and basic knowledge of concepts to meet such academic needs, these teachers cannot begin to assess, evaluate, and recommend proper programs, techniques, or materials for these handicapped children. Consequently, it would be logical for these teachers to assume that hearing-impaired children who are mainstreamed into their regular classrooms or remedial reading sessions can be taught, to learn, and to perform at the same level as their normal-hearing classmates. These are erroneous assumptions.

To understand the plight of the reading problems of hard-of-hearing children, the status of deaf children will be briefly discussed to emphasize problems of hard-of-hearing children integrated in the regular classrooms

and especially in relation to teacher knowledge about hearing and reading. Research on the reading achievement of deaf children of all ages have shown low reading scores. Deaf children between 8 to 10 years of age had achieved a mean grade equivalency of 2.3 to 3.3 on paragraph and word meaning scores on reading tests (Magner, 1964; Hatcher, 1974). The average eighteen to nineteen year-old deaf students had achieved a median of sixth grade equivalency in paragraph meaning (Fusfeld, 1955; Magner, 1964). Other secondary deaf students had achieved about five years in paragraph meaning and vocabulary on reading tests (Goetzinger and Rousey, 1959; Balow, Bruce and Peoploe, 1971).

National surveys have revealed that deaf children between ten and sixteen years of age had achieved mean grade equivalents of 2.7 to 3.5 on reading tests (Furth, 1966; Wrightstone, Aronow, and Moskowitz, 1963). Half the deaf students at age 20 or younger read at 4.5 grade equivalency or lower. Only ten percent of these hearing eighteen year old could read at or above an eighth grade level. For comparison, the average normal hearing child reaches a reading grade equivalent of 8.2 before age 14 (Trybus and Karchmer, 1977).

One investigator concluded that these low scores are due to linguistic incompetence rather than reading deficiencies (Furth, 1966).

Others felt that the teaching method should not be cited as the cause of academic or reading failures (Lane and Baker, 1974).

In a national survey of materials and procedures used to teach reading to hearing-impaired children, it was revealed that almost three-fourths (73.5%) of the programs used by the teachers of the hearing impaired were using basal readers (LaSasso, 1978). These are the same materials used by regular classroom and remedial reading teachers and teachers of the learning disabled as either primary or supplementary approaches in the developmental and remedial reading programs.

Regardless which direction the blame is placed, the reading problems of deaf and hearing-impaired children cannot be further ignored, particularly hard-of-hearing children who will and must be mainstreamed in regular classrooms.

The success of full integration of hearing-impaired students into regular classrooms depends upon their highly developed oral skills, at least average intelligence, and parent support (Reich, Hambleton, and Houldin, 1977). These criteria were based on full integration of the auditorially-impaired students in contrast to those auditorially-impaired students who are mainstreamed on a part-time basis into regular classrooms. Teachers of the hearing impaired in

integrated settings have indicated more need for competency in their field. Years of training and hours of student teaching were considered more important by these teachers for adequacy of professional experiences (Doctor, 1979). If these teachers of the hearing impaired have these attitudes about their professional competencies, how must regular classroom and reading teachers and teachers of the learning disabled feel about their professional competencies when confronted with one or more auditorially impaired students? In general, teachers indicated mixed feelings toward integration and toward their own competencies to teach the hearing and visually impaired (Logan, 1977).

Without proper training about auditory acuity, hearing impairment, and the relationship between hearing impairment and reading on the part of the teacher, the academic achievement of auditorially-impaired children will suffer and deteriorate more. Both teachers and students will be handicapped.

Even though each group exhibited similar knowledge about the relationship between hearing impairment and reading, it is doubtful whether teachers and most specialists are aware that a relationship exists between hearing and reading when considering such factors as high-tone frequency losses and reading disability.

High tone losses affect the child's ability to deal with certain consonant sounds and blends while still retaining the ability to hear vowel sounds. These children are handicapped in responding to the reading programs that emphasize phonics, because beginning reading programs stress consonant phoneme-grapheme correspondence. Since some hard-of-hearing children who are in the regular classrooms have been introduced to or are reading phonics-based readers, an appraisal of the teachers' knowledge of their abilities to plan and evaluate hard-of-hearing children's performances in discriminating sounds related to their handicap might offer added insight to this problem and classroom instruction.

It is doubtful whether teachers and some specialists are aware that a relationship exists between hearing and reading when considering such factors as the kind of method of instruction employed and the extent of auditory disability, grade level, and type of hearing loss and that other factors affect hearing-impaired children's performance such as type of frequency loss or extent of volume loss in hearing, pitch of the speaker, mode of presentation, inflection, voice, and the learners' specific hearing loss due to pitch or frequency, especially in the speech ranges (Bond, 1935; Kennedy, 1942; Henry, 1947).

It is doubtful that these teachers and specialists are aware of noise levels in the classroom affecting

auditory discrimination tasks, especially during testing situations (Nober, 1973), that nose levels are factors in relation to grade level achievement of the hearing impaired (Sanders, 1965), and that noise levels possibly affect an environment which would otherwise be considered adequate for auditory discrimination of intelligible speech (Kingsbury and Taylor, 1967). Teachers and some specialists who are encountering these children with hearing impairments must and should be alerted to these factors.

There are inventories available to assess teachers' knowledge of reading, but there are no inventories available to appraise the knowledge of reading pedagogy among teachers of the hearing impaired and to assess teachers' and specialists' knowledge of the relationship of hearing impairment to reading (Kingston, Brosier, and Hsu, 1975; Rorie, 1975).

Some inventory or survey should be available to assess and evaluate teachers' and specialists' competency. To reiterate, teachers of the hearing impaired in integrated settings have indicated more need for competency in their field. Years of training and hours of student teaching were considered more important by these teachers for adequacy of professional experiences (Doctor, 1979).

Teachers of the hearing impaired recognize the importance of competencies for teaching the deaf and hard-of-

hearing (Casella, 1977; Logan, 1977; Doctor, 1979). Some inventory or survey should be available to assess and evaluate this competency among teachers and specialists. Such information should assist in the planning for future inservice training sessions for teachers and various specialists who would be or are working with the auditorially impaired in the regular classrooms or remedial situations.

An appraisal of teachers' and specialists' attitudes are essential in order to determine the needs of staff members and plan for staff development. Teachers and specialists have indicated this need in various areas. Teachers had developed positive attitudes and were knowledgeable about handicapped individuals when exposed to courses pertaining to information about and the training of the handicapped in contrast to teachers not exposed to such classes (Corkern, 1978). Such an appraisal of courses for teachers and specialists about hearing impairment are essential to the educational growth and development of hearing-impaired children and the mental health of both teachers and students.

Conclusions

Teachers do not know much about the basic concepts of auditory acuity, hearing impairment, and reading; and they are not prepared to teach the hearing impaired in the regular classrooms.

Mainstreaming has presented the regular classroom teachers and some specialists, such as teachers of the learning disabled and reading teachers, with a new and unique problem in terms of meeting the needs of special children in their classrooms. The problem concerns the threat to their professional competencies to teach special needs children, especially the auditorially impaired.

Recommendations

The following list of recommendations may be useful for future considerations:

It is recommended that a needs assessment, survey, and/or appraisal of the teachers' and specialists' attitudes toward the hearing impaired be considered for healthy school atmospheres.

It is recommended that a pre- and post-assessment be employed to assist in future staff development projects, pertaining to the hearing impaired in the regular classrooms.

It is recommended that more teachers of the hearing impaired and speech and language pathologists are incorporated as consultants at the elementary level on a daily basis.

It is recommended that pre-service and in-service education be implemented to acquaint teachers and some specialists with the special techniques and learning styles of the hearing impaired in the regular classrooms.

Lastly, it is recommended that teachers and specialists be inserviced in teaching reading to hearing-impaired children by meeting some minimal requirements and competencies even though they have expertise in teaching developmental reading at the regular education level.

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